

Log R-52

Log R 52 No 1381 Rec R-74-29 and 30

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# NATIONAL TRANSPORTATION SAFETY BOARD WASHINGTON, D.C.

ISSUED: October 11, 1974

Forwarded to:

Honorable John W. Ingram  
Administrator  
Federal Railroad Administration  
Washington, D. C. 20590

SAFETY RECOMMENDATION(S)

R-74-29 & 30

On July 19, 1974, a tank car was punctured during switching operations in the Norfolk and Western Yard at Decatur, Illinois. On September 21, 1974, a tank car was similarly punctured during switching operations in the Southern Pacific Englewood Yard, near Houston, Texas. Both tank cars contained heavier-than-air compressed flammable gases, which, as a result of the punctures, leaked and exploded. Several persons were killed and many were injured.

On January 22, 1972, a similar accident occurred in the Alton and Southern Gateway Yard in East St. Louis, Illinois. Each of these accidents produced injury and damage well beyond the confines of railroad property.

Following the 1972 accident at East St. Louis, the Safety Board recommended that:

"The Federal Railroad Administration establish a requirement that railroad carriers handle switching operations of cars containing large shipments of hazardous material, with a danger range beyond railroad property boundaries, in the same manner as they handle switching operations of cars containing explosives." (Recommendation No. R-73-2.)

There had been no similar accident on record, and only one occurrence of the explosion of liquefied petroleum gas by detonation in open air. The Board, however, considered that

this accident demonstrated the possible results from the release of hazardous material having a danger range far beyond the boundaries of railroad property, and that precautions should be taken to prevent errors in switching from impinging upon the community. The background of the recommendation in the report showed that "minor accidents" were being tolerated in many instances in railyards and that a small percentage of cars were being subjected to switchyard impact above 10 mph.

The FRA reply said essentially that a wide range of materials would have to be included under a recommendation designed to confine damage to the railroad property, and gave the opinion that it would be more cost-beneficial to prevent overspeed impacts in all railroad hump yards than to require controlled movements on the subject cars by locomotive.

The accident at Decatur, Illinois, on July 19, 1974, demonstrated that detonation of LPG gas in open air, following a switching accident, could recur. This accident involved switching in a flatyard rather than humping operations, and also involved free-rolling cars. Improvements to humping could not have prevented this accident.

The Hazardous Materials Regulations Board, over signature of the Administrator, FRA, on August 9, 1974, issued a Notice of Proposed Rulemaking which would implement the Board's 1973 recommendation that evolved from the East St. Louis accident. The proposal also mentioned an accident at Wenatchee, Washington, on August 6, 1974, which is currently being investigated by the Safety Board. In that accident a large scale explosion occurred with effects far beyond the railroad yard. It is not yet determined whether the Wenatchee accident involved switching.

The FRA proposal would in effect, prohibit switching of all freight cars placarded "dangerous," without a locomotive attached, and would prohibit the same placarded cars from being coupled by free-rolling car impact during switching. This proposal contemplates essentially the same scope of definition of hazardous materials which was described by the FRA in its earlier reply to the Board's initial recommendation.

While this notice (Docket No. HM-120; Notice No. 74-11) was still open for comment, the accident occurred at the Englewood Yard at Houston. This accident involved the same detonation-in-open-air explosion mechanism as in the accidents at Decatur and East St. Louis, Illinois. It also involved a puncture in the head of a tank car by an opposing coupler similar to those found in the Decatur and East St. Louis accidents. The cars involved had been humped, as at East St. Louis.

Whereas the Board's original recommendation sought to cover the full range of disastrous effects on the community which might arise from free switching of large quantities of any hazardous material, the Decatur and Houston accidents have drawn attention more specifically to the escape of heavier-than-air compressed flammable gases. The occurrence of open air detonation of such gases in a railroad yard environment, thought to be unique in 1972, is now considered to be a probability. As the East St. Louis accident report pointed out, the mechanism by which the normally expected flashfire becomes an explosive detonation is as yet unknown. The compressed gases released in the three accidents were not the same, propylene having been released at East St. Louis, isobutane at Decatur, Illinois, and butadiene at Houston. Nevertheless, all three cases exhibited the phenomenon of open air detonation in a railroad yard. Although the three accidents carry no statistical significance a question is now raised as to whether there is some undetected reason for such detonations to occur in railroad yards.

The Safety Board believes that since these three accidents involved compressed flammable gases, the final FRA rule should include this category of hazardous materials. The later accidents have not only increased the predictability of a recurrence, but have also focused attention on compressed flammable gases in free-rolling switching operations. Therefore, the problem of detonation of compressed flammable gases must be dealt with at this time, to prevent recurrence of this type of accident.

The time allowed to respond to the NPRM has been extended 30 days beyond the original date of September 20, 1974.

Consequently, at least 30 days will pass before any action will be taken to prevent recurrences.

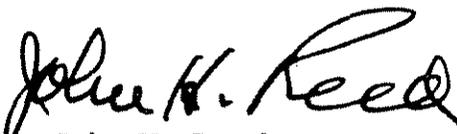
The Safety Board believes that prompt action is required and that the emergency powers provided to FRA under the Federal Railroad Safety Act of 1970 were intended to cover such new situations. These emergency powers should be employed to prevent tank cars containing compressed flammable gases from rolling-free during switching operations or from being struck by or coupled to other free-rolling cars.

In view of the above, the National Transportation Safety Board recommends that the FRA:

1. *R(74-29)* Through its emergency powers, issue an order to prohibit switching of tank cars containing compressed flammable gases unless the tank cars are under the control of a locomotive and prohibit such tank cars from being coupled by other free-rolling equipment.
2. *R(74-30)* To assure conformance with such an order, issue a list of the compressed flammable gases that are normally shown on waybills.

These recommendations are temporary pending the adoption of regulations pursuant to Notice 74-11, Docket HM-120.

REED, Chairman, McADAMS, THAYER, and BURGESS, Members, concurred in the above recommendations. HALEY, Member, did not participate.

  
By John H. Reed  
Chairman

cc: Secretary Brinegar